

In the Claims

1. (currently amended) A communications multi-service network comprising: a plurality of nodes interconnected via a plurality of quality of service capable tunnels and incorporating a frame-mode MPLS architecture ~~whereby~~ in which IP services are run directly over a frame-based core part of said multi-service network and legacy services are run over ATM adaptations and emulated ATM services on said core part of the network, the multi-service network further comprising one or more virtual switches for switching data traffic, each virtual switch comprising managed switching resources from a number of said interconnected nodes.

2. (previously presented) A frame-mode switching communications network comprising: a plurality of core nodes establishing a multi-service transport network; a plurality of service nodes each coupled to a core node to provide access to the transport network; and a network management system arranged to define and manage one or more virtual public/private networks within said communications network, wherein groups of said core nodes are configured as abstract nodes within which any available path can be selected to achieve a requested connection, wherein an end to end label switched path is established via the management system by specifying a number of abstract nodes between two specified service nodes.

3. (previously presented) A communications network as claimed in claim 2, wherein each end to end path is specified by identifying first and second service nodes and one or more abstract nodes therebetween.

4. (previously presented) A communications network as claimed in claim 3, wherein a virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths.

5. (previously presented) A communications network as claimed in claim 4, wherein each abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node.

6. (previously presented) A communications network as claimed in claim 5, incorporating a super-ordinate management function arranged to control creation, modification and deletion of virtual switches.

7. (previously presented) A communications network as claimed in claim 6, wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realize those VPNs.

8. (previously presented) A communications network as claimed in claim 7, incorporating a sub-ordinate management function arranged to provide virtual switch management.

9. (previously presented) A communications network as claimed in claim 8, wherein a sub-network manager is responsible for constructing an abstract node information model representation of the network which it passes to a super-ordinate manager.

10. (previously presented) A method of operating a communications multi-service network comprising: interconnecting a plurality of nodes via a plurality of quality of service capable tunnels such that said nodes incorporate a frame-mode MPLS architecture using ATM for low or medium capacity access and core transport of legacy services on a frame based core part of said multi-service network; and using frame mode for corporate user access and for other core transport on said frame based core part of said multi-service network; the method further comprising using one or more virtual switches to switch data traffic, each virtual switch comprising managed switching resources from a number of said interconnected nodes.

11. (currently amended) A method of operating a frame-mode switching communications multi-service network comprising a plurality of core nodes establishing a multi-service transport network, including a plurality of service nodes each coupled to a core node ~~whereby~~ in which access to the transport is provided, and having a network management system arranged to define and manage one or more virtual public/private networks within said communications network, the method comprising: configuring groups of said core nodes as abstract nodes within which any available path can be selected to achieve a requested connection, and wherein an end to end label switched path is established via the management system by specifying a number of abstract nodes between two specified service nodes.

12. (previously presented) A method as claimed in claim 11, wherein each end to end path is specified by identifying first and second real nodes and one or more abstract nodes therebetween.

13. (previously presented) A method as claimed in claim 12, wherein a virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths.

14. (previously presented) A method as claimed in claim 13, wherein each abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node.

15. (previously presented) A method as claimed in claim 14, including creation, modification and deletion of virtual switches via a super-ordinate management function.

16. (original) A method as claimed in claim 15, wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.

17. (original) A method as claimed in claim 16, wherein ATM is used for low or medium capacity access, and wherein frame-mode is used for access to corporate sites and for core transport.

18. (previously presented) A communications network comprising: a plurality of core nodes establishing a transport network; a plurality of service nodes each coupled to a core node to provide access to the transport network; and a network management system arranged to define and manage one or more virtual public/private networks within said communications network, wherein groups of said core nodes are configured as abstract nodes within which any available path can be selected to achieve a requested connection, and wherein an end to end label switched path is established via the management system by specifying a number of abstract nodes between two specified service nodes;

wherein a virtual public/private network (VPN) is defined with multiple stages of first level constraint-based routed label switched paths;

wherein each abstract node is defined by an IP address prefix, and all core nodes which include that prefix in their IP address are part of that abstract node;

the communications network incorporates a super-ordinate management function arranged to control creation, modification and deletion of virtual switches; and

wherein said super-ordinate manager is adapted for defining virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.

19. (previously presented) A communications network as claimed in claim 18, incorporating a sub-ordinate management function arranged to provide virtual switch management.

20. (previously presented) A communications network as claimed in claim 19, wherein a sub-network manager is responsible for constructing an abstract node

information model representation of the network which it passes to a super-ordinate manager.

21. (currently amended) A method of operating a communications multi-service network comprising a plurality of core nodes establishing a multi-service transport network, including a plurality of service nodes each coupled to a core node ~~whereby~~ in which access to the transport is provided, and having a network management system arranged to define and manage one or more virtual public/private networks within said communications network, the method comprising:

- configuring groups of said core nodes as abstract nodes within which any available path can be selected to achieve a requested connection;

- establishing an end to end label switched path via the management system by specifying a number of abstract nodes between two specified service nodes;

- specifying each path by identifying first and second service nodes and one or more abstract nodes therebetween;

- defining a virtual public/private network (VPN) with multiple stages of first level constraint-based routed label switched paths;

- defining each abstract node by an IP address prefix, and including all core nodes which include that prefix in their IP address as part of that abstract node;

- the method including creation, modification and deletion of virtual switches via a super-ordinate management function; and

- wherein said super-ordinate manager is adapted for defining said virtual private/public networks (VPN) and for placing traffic trunks to realise those VPNs.

22. (previously presented) A method as claimed in claim 21, wherein ATM is used for low or medium capacity access, and wherein frame-mode is used for access to corporate sites and for core transport.

23 to 28 (cancelled).